REMARKS

On page 2 of the Office Action the Examiner rejected claims 1-5 and 8-20 under 35 U.S.C. § 112, second paragraph.

Reconsideration is requested.

Applicants' use of the term "filtrate side" (19) to describe the portion of the filtration system downstream of the filter element and the use of the term "unfiltrate side" (7) to refer to the portion of the filtration system upstream of the filter element is fully supported by the specification and claims as originally filed. Applicants state that these definitions are not ambiguous and submit that it is an axiom of patent law that an applicant may be his or her own lexicographer. Merck & Co., Inc. v. Teva Pharmaceuticals USA, Inc., 395 F.3d 1364, 1377-78 (Fed. Cir. 2005). Further, the terms "filtrate side" and "unfiltrate side" are used in the same manner in U.S. Patent No. 6,692,786 cited by the examiner. Applicants have amended claim 1 to correctly recite that the recirculation pump (4) is located on the "unfiltrate" side of the filter element. Support for this amendment is contained in Fig. 2 and the specification at paragraph 0043 as originally filed. Applicants submit that this amendment places the current application in condition for allowance and does not require the Examiner to conduct further searches. No new matter has been added.

On pages 2-5 of the Office Action the Examiner rejected Claims 1-20 under 35 U.S.C. §103(a) as being unpatentable over WO 95/20038 (U.S. equivalent: U.S. Patent No. 6,692,786 (hereinafter Denk et al.)) in view of U.S. Patent No. 6,139,724 (hereinafter Strohm et al). This is the only rejection in the Office Action.

Reconsideration is respectfully requested.

Currently only claims 1-5 and 8-20 are pending in the current application. Therefore the rejection with regard to claims 6 and 7 is considered moot.

Denk et al. discloses a beer clarification process by crossflow microfiltration. The transmembrane pressure is controlled in the Denk et al. device by gas cushions G1 and G2 and a complex gas regulation scheme. (*See* Denk at col. 8, lines 40-45). The Denk et al. reference discloses a system where the pressure is applied over a storage tank (1) on one side of the system and over a collection tank (5) on the opposite side of the system

(see Fig. 1, and col. 5, lines 31-37). This method is entirely contrary to the presently claimed method, which provides a simplified and cost-effective beverage filtration system. Additionally, the backwashing described in the Denk et al. reference occurs over periods of minutes or hours (see Fig. 3, and col. 6, lines 11-51).

The Denk et al. reference does not disclose (1) the backflush pump located on the filtrate side of the filter module; (2) filtrate pressure being controlled by two pumps or (3) a backflushing time period of milliseconds; as recited in the amended claims of the present application. While Denk et al. does refer to a pump on the feed/retentate side, this teaching does not render obvious the specific use of recirculation pump (4) on the unfiltrate side and a backflush pump (5) on the filtrate side to create the specific pressure differences at specific points in the crossflow filtration device as recited in the amended claims of the present application. In configuring the system in the manner claimed, and in accordance with the additional filter element cleansing steps, applicants unexpectedly have found a cost effective system for beverage filtering.

As shown in Figure 1 of the present application, the inclusion of the pumps on both sides of the filter enables a more efficient system to be obtained, without the separate chemical and backflushing systems of the prior art. In the present invention, the backflush pump is suitable for handling both the backflushing and hot water/cold water/chemical cleaning expedients. The process of Denk, which does not teach or suggest the inclusion of a backflush pump, could not effect such a simplified system and, in effect, by teaching the separate systems, teaches away from the present claimed invention.

Further, the method of cleaning the filtration membrane as disclosed in the Denk et al. reference is completely different from the method disclosed in the present application. One difference is that the method disclosed by Denk et al. first interrupts the flow of beer in the system and then washes with caustic soda followed by rinsing with water (see col. 6, lines 52 to col. 7, line 14, and claim 1 steps a-f). In contrast, the steps of the presently claimed method begin with a backwashing step using the filtrate followed by a backflushing with water, which is subsequently followed by a solution of chemicals (see steps a-e of claim 1 of the present application). Additionally, Denk et al. does not disclose the further step of filling the filter module with degassed water (step h of claim 1 of the present application).

Moreover, the Denk et al. reference does not disclose repeating of steps a and b as recited in claim 1 "until the filtrate flow goes below the lower predetermined limit value" (step c). Specifically, there is no disclosure of predetermined limit values in the Denk et al. reference.

Also, nowhere in the Denk et al. reference is there a disclosure even remotely related to the recitation that the offset value ($offset_n$) can be calculated in accordance with the formula as set forth in Claim 11. Further, the Examiner cannot simply state that this is an "optimization", these are novel claim elements that are not disclosed in the cited prior art.

As a secondary reference, the Examiner cited to Strohm et al. because it contains teachings related to caustic cleansing agents, pre-rinsing with water and the use of CO_2 gas to evacuate the system. However, the Strohm et al. reference does not teach a system that uses backflushing with filtrate during the filter cleansing method and therefore operates in an unrelated manner to the method disclosed and claimed in the present application. Additionally, the Strohm et al. reference discloses a filtration system that comprises multiple filter elements arrayed in parallel rows (see col. 5, lines 3-6 and Fig. 1). Fig. 1 of Strohm et al. depicts at least 4 filter elements. This is in contrast to the efficient and cost effective method disclosed by the present invention.

Further, Applicants submit that the Examiner's assertion that Strohm et al. use of CO_2 gas renders obvious the use of degassed water as recited in the claims of the present application is in error. The Examiner's statement that the CO_2 gas is an equivalent of degassed water is pure conjecture and has no basis in the relevant art as it pertains to the Applicant's invention. This can be seen in the fact that the CO_2 gas is used to flush the Strohm et al. system before and after the filter element cleansing process, whereas in the present invention the degassed water is only used after the filter element has been cleansed (see steps f-h of claim 1 of the present application and col. 4, lines 7-21 of Strohm et al.). Therefore the CO_2 gas and the degassed water are not equivalent elements performing equivalent steps.

Additionally, neither the Denk et al. nor Strohm et al. references disclose "forcing out the [degassed] water from the filter module (2) with filtrate" (step i). Both of the cited prior art references teach the final step of flushing the filter element using CO_2. (See Denk et al. at col. 7, lines 35-43 and Strohm et al. at col. 4, lines 7-21); however,

there is no disclosure in either reference of using the filtrate or degassed water to flush the system directly after the chemical and water wash. Because there are no teachings or suggestions in the cited prior art for the above claim elements, Applicants submit that the 103(a) rejection is in error.

At the end of the Arguments section of the Office Action the Examiner refers to U.S. 5,252,218 (hereinafter "Muraldihara et al."); U.S. 5,958,243 (hereinafter "Lawrence et al.") and U.S. 5,354,466 (hereinafter "Yunoki") as generally teaching back-wash pumps. The Examiner has made no rejection with regard to these references either under 35 U.S.C. 102 and/or 103, and has not pointed to any manner in which the above cited references could be combined with the previously cited art to render the claims of the present application obvious. However, as set forth below, Applicants submit that these references do not teach or suggest (alone or in combination) the invention as claimed in the present application.

All three of these prior art references disclose filtration assemblies with pumps on opposite sides of the filter elements; however, none of these references teach or suggest (alone or in combination) the presently claimed invention.

Muraldihara et al. teaches a separation system for non-aqueous suspensions (see col. 2, lines 10-55) and therefore is non-analogous art. The present claimed invention is directed towards beverages, in particular beer, which is an aqueous liquid. Further, the Muraldihara et al. filtration system does not disclose backflushing with additional filter cleansing elements (water rinse, chemical rinse, degassed water, etc...) as taught by the present invention. Muraldihara et al. discloses the use of cleansing agents, however, these are different agents and they are not employed in a backflushing manner (see col. 7, lines 39-65).

The Yunoki reference discloses a prior art system that does not teach any of the filter cleansing elements claimed in the present invention beyond rudimentary backflushing using filtrate. Moreover, the "invention" in Yanoki et al. only uses one pump (see. Figs. 1-2 and col. 1, lines 12-26 and col. 3, line 15 to col. 4, line 5).

Finally, Lawrence et al. discloses a filtration system that employs back flushing of filtrate stored in a separate storage tank (19), and requires complex flow meters (7) and pump speed controllers (8) (see col. 5, line 15 to col. 6, line 11). This system is more complex and expensive to operate than the presently claimed system. Further, as with the

other newly cited references, Lawrence et al. does not disclose the backflushing of the filter with additional cleaning agents. Therefore, Lawrence et al. teaches away from the present invention because it requires elements and steps that are costly, cumbersome and inefficient as compared to the present claimed invention.

Moreover, none of the newly cited prior art teach or suggest each and every step of the presently claimed invention or alleviates the deficiencies of the previously cited prior art, including the use of backflushing using water, chemicals and degassed water. Therefore the simple recitation of two pumps on opposite sides of a filter element does not render the totality of the present invention obvious or anticipated. Further, because these system do not contain any of the additional filter cleansing elements operating in a backflushing manner as taught in the present invention a person skilled in the art would not be able to combine the newly cited art with the previously cited prior art to achieve a system that is capable of performing each and every step of the present invention without undue experimentation.

In the Response to Arguments section of the Office Action the Examiner cites to a "Send" reference at col. 3, lines 45-67. Applicant is unaware of a "Send" reference, but presumes that the Examiner was referring to col. 3, lines 45-67 of Denk et al. This section of the Denk et al. reference teaches a method for altering the pressure exerted on the filtration system through the use of the gas cushions (G1 and G2). In the Denk et al. reference the pressure exerted by the gas cushions changes based on a timed sequence (see Denk at al. at col. 3, lines 40-44). Specifically, the Denk et al. reference states that "[t]he time function for controlling the membrane pressure is preferably an essentially periodical, e.g. sinusoidal, triangular or sawtooth-like function" (see Denk at al. at col. 3, lines 45-48). Specifically, this method is dependent on timed responses and not filtration output as claimed in the present application. In contrast, the filtrate flow in the present invention is controlled by a recirculation pump (4) and a back-flushing pump (5), and is regulated based on the output of the filter element (see paragraph 0032-0034 of the present application). More specifically, nowhere in the Denk et al. reference does it teach to regulate the filtration system in accordance with the formula: $offset_n$=(current output-15% $offset_{n-1}$) 0.9+$offset_{n-1}$.

Therefore, based on the above amendments and remarks, Applicants request that the above 103(a) rejection be withdrawn.

Based upon the above amendments and remarks, Applicants respectfully submit that amended claims 1-5 and 8-20 define patentable subject matter and that the present application is in proper form for allowance. This amendment is being submitted within two months of the mailing of the final rejection and does not contain amendments that require a new prior art search and therefore Applicants respectfully request either an Advisory Action or an allowance of all claims.

Favorable consideration and early allowance is respectfully requested and earnestly solicited.

Respectfully submitted,

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